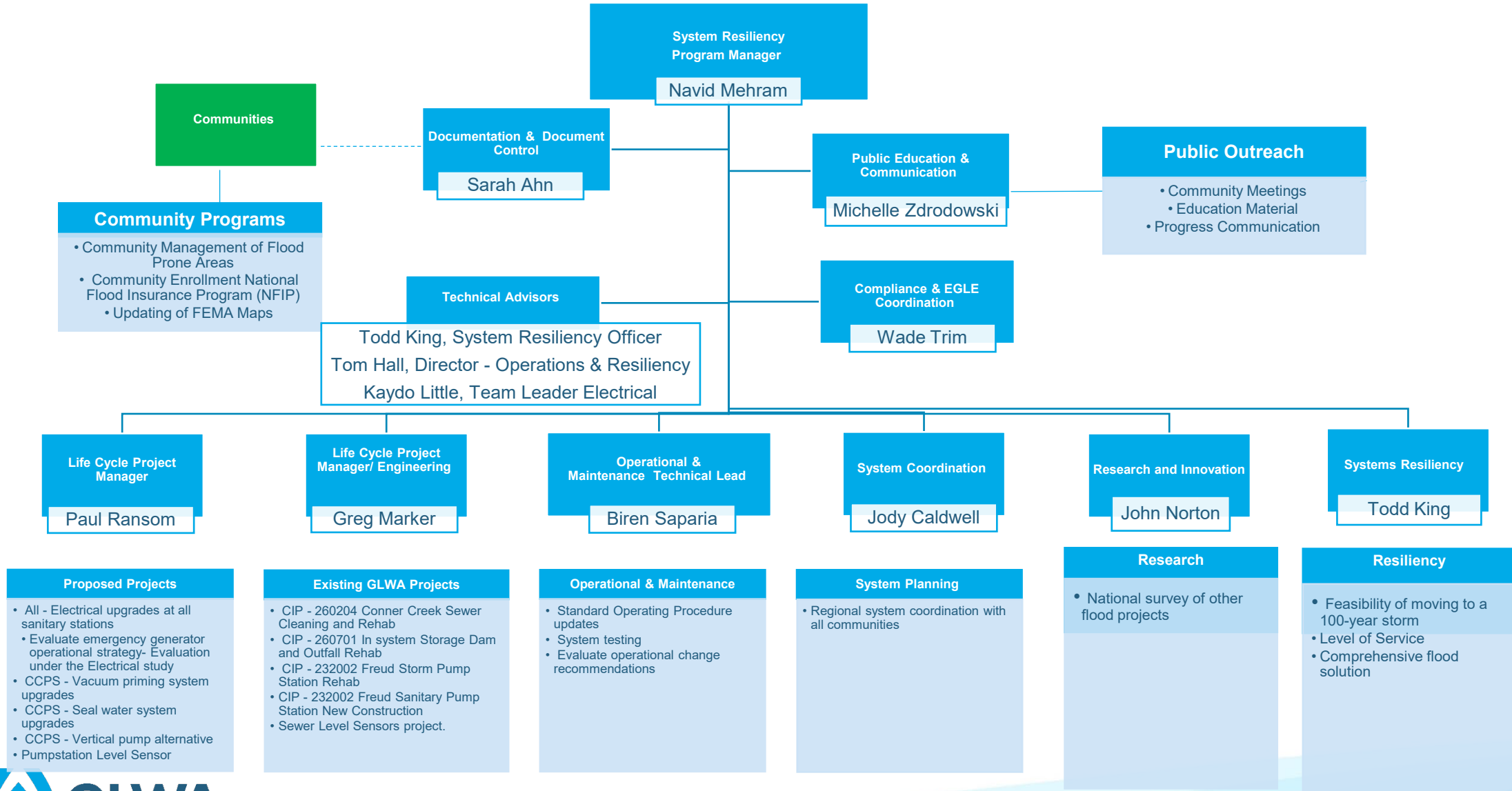




Resiliency Team Progress GLWA Board Of Directors

June 26, 2024 | Navid Mehram, P.E.

Resiliency Delivery Team



GLWA System Resiliency Efforts

Independent Investigation of 2021 Flooding Status of 25 Recommendations

- 7 have been **completed**
- 14 are currently **in progress**
- 1 will start when a **pilot at Conners Creek Pump Station is completed**
- 3 will be completed **in the Regional Flood Mitigation Study**

Executive Summary - Short Term Measures

Project Milestone	Project Status			Notes
	Not Started	In Progress	Completed	
Short Term Measures				
General Recommendation				
Pump availability during storm events.				GLWA has continued to monitor the system closely to ensure no more than 1 pump out of service at each station.
Pump Stations				
Testing of the Vacuum Priming System.				
Pump sequence testing.				
Operational documentation and communication.				This effort is ongoing, several SOP's have been reviewed with some minor modifications.
Electric Equipment				
Power conversion from Public Lighting Department (PLD) to DTE.				
Back up generator measures.				This measure is being evaluated as part of the larger electrical resiliency project anticipated to be completed June 2024.
Confirm that the power supply for each DTE can support the entire station.				This review is incorporated in the larger electrical resiliency project.
Mechanical Equipment				
Conner Pumpstation Seal Water System.				Bids received, working on award.
Vacuum Priming System upgrade.				Documents are in preparation for advertisement.

Executive Summary - Medium Term Measures

Project Milestone	Project Status			Notes
	Not Started	In Progress	Completed	
Medium Term Measures				
General Recommendation				
Prioritization of the Wastewater Capital Improvement Planning (CIP) projects.			Completed	Complete/Ongoing.
Evaluation of future rainfall beyond the Atlas 14.				This task will be captured within Water Resource Development Act with USACE.
Take into consideration other climate change factors into the design.	Not Started			This task will be captured within Water Resource Development Act with USACE.
Pumpstation				
Continue with the Freud Pump Station projects.		In Progress		In progress/contract awarded.
Electical Equipment				
Upsize the transformers at each facility to run the entire facility.		In Progress		This review is incorporated in the larger electrical resiliency project anticipated to be completed June 2024.
Electrical reliability study for Freud and Conner Pump Stations.		In Progress		
Mechanical Equipment				
Complete other scenarios as proposed through the Clemson Engineering scale model.			Completed	
Review the idea of vertical pumps for the Conner Storm Station.			Completed	
Operational Measures				
Inspection and monitor the Intake Flow Conditioning (IFC) in both the Conner and Freud Pump Stations.	Not Started			This item is pending the improvements to Freud and Conner Pump Stations.
Review of previous studies.		In Progress		GLWA continues to review prior studies as new projects progress.
Studies				
Level of service.	Not Started			This task will be captured within Water Resource Development Act with USACE.
Dynamic System Operations Study	Not Started			This task will be captured within Water Resource Development Act with USACE.
Stormwater/Wastewater Master Plan	Not Started			This task will be captured within Water Resource Development Act with USACE.

Executive Summary - Long Term Measures

Project Milestone	Project Status			Notes
	Not Started	In Progress	Completed	
Long Term Measures				
General Recommendation				
Feasibility of moving to a 100-year storm.				This task will be captured within Water Resource Development Act with US Army Corps of Engineers (USACE).
Local government program for voluntary purchase of flood prone areas.				
Local government public outreach campaign for flood risk and purchasing flood insurance.				
National research of other large-scale flood reduction projects.				GLWA began communication with other utilities in the US alternative approach, the survey is being considered.
Pump Stations				
Medium-term solutions are not successful.				The project team has incorporated this into the Conner Storm project schedule.
Further automation of the pumping stations.				Steps are being taken toward this effort. An example includes the seal water system for Conner.
Regional System Coordination				
Review of the member partners' optional strategy to find alternative operations.				GLWA has started discussion around the Regional Operational Plan. Additionally, GLWA is coordinating with member partners during major storm events.
Local government engagement in the National Flood Insurance Program (NFIP).				
Local government should consider updating the flood maps.				
GLWA community outreach.				Regular cadence has been established.
Community flood collection data to provide guidance into modeling validation.				Some communities have developed processes to track flooding information.

Sewage Pump Stations Power Reliability Study – Preliminary Results

- Field investigation of all 9 pump stations has been completed.
- Draft technical memos for all 9 pump stations have been submitted.
- Review of draft Technical memos and recommended improvements is ongoing.

Station	Recommended Improvements	Existing Availability	Future Availability	Cost *
Belle Isle	Alternative 1: Do Nothing	99.7%	N/A	N/A
Blue Hill	Alternative 2A: Configure Generator System to Backup Both Transformers	98.9%	99.8%	\$3M
Connor Creek	Alternative 2A: Reconfigure Vacuum Pump Power Distribution Replace Utility Transformers w/ Larger Size Configure Generator System to Backup All Utility Transformers	95.0%	99.4%	\$4M
Fairview	Alternative 1: Do Nothing	99.7%	N/A	N/A
Fischer	Alternative 2: Upgrade Generator (Station Firm Capacity) Upgrade MCC (M-T-M)	99.8%	99.8%	\$700K
Freud	Alternative 2: Configure Generator System to Backup All Utility Transformers Upgrade Primary Switchgear (M-T-M-T-M)	97.3%	99.4%	\$8M
Northeast	Alternative 2: Add Transfer Scheme Between MV MCC-1 and MV MCC-2	99.5%	99.6%	\$500K
Oakwood	Alternative 1: Do Nothing	99.7%	N/A	N/A
Woodmere	Alternative 1: Do Nothing	99.8%	N/A	N/A

**The estimate includes the improvements identified in the alternative. Replacement of obsolete equipment is not included in the estimate.*

**Blue Hill evaluation does not include ongoing after-action analysis of rain events associated flooding claims.*

Conner Creek PS Seal Water and Vacuum System

2303832 – Pump Seal Water Improvements

- Contract Price of \$595,400
- 02/27/24 - Notice to Proceed
- 04/09/24 – Work began Onsite
- 05/24/24 – Hydraulic Tie-Ins Complete
- **07/12/24 – New Panels to arrive Onsite***
- 08/02/24 – Electrical Tie-Ins to be Complete
- 08/25/24 – Substantial Completion
- 09/24/24 – Final Completion

2304058 – Pump Vacuum Priming Level Switch Addition

- Estimated Contract Price of \$536,000
- **06/25/24 – Advertisement Date***
- 07/18/24 – Solicitation Meeting/Site Tour
- 07/25/24 – Questions Due
- 08/01/24 – Bids Due
- 08/22/24 – Estimated Notice to Proceed
- 05/19/25 – Estimated Substantial Completion
- 06/18/25 – Estimated Final Completion

Conner Pump Station Pump Replacement Design

02/08/24 – Design Memos 1, 2, 3, 6, 7, & 10 Finalized

- 1 – Operating Conditions & Capacity
- 2 – Replacement Pump Control Description
- 3 – West Storm Wet Well Isolation Chamber
- 6 – Electrical Improvements
- 7 – Vacuum Priming System Modifications
- 10 – Replacement Pump Installation

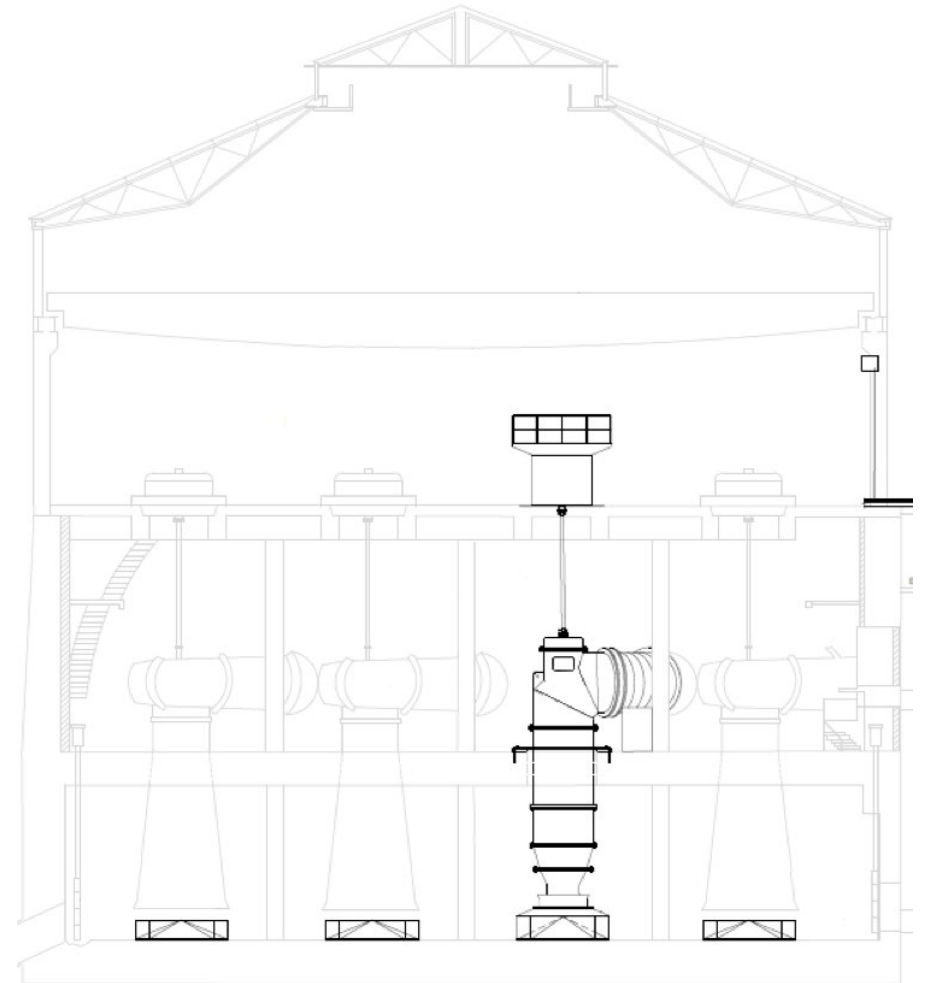
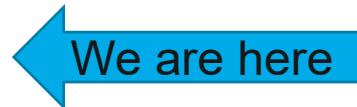
02/15/24 – 60% Design Workshop

04/12/24 – Design Memos 4, 5, 8, & 9 Finalized

- 4 – East Wet Well Isolation Chamber
- 5 – Replacement Storm Pump
- 8 – Storm Pump Intake Flow Conditioning
- 9 – Facilitation of Work in the Wet Well

05/15/24 – 90% Design Workshop

06/21/24 – 100% Design Submittal



Conner Pump Station Sanitary Station Design

12/22/23 - Design Memo 1 Submitted

1 – Wet Well Configuration & Sanitary Pumps

01/19/24 – Design Memos 2, 3, & 4 Submitted

2 – Zoning and Permit Requirements

3 – Cite Civil, Conveyance, & Access

4 – Building Requirements

01/26/24 – Design Memos 5 & 6 Submitted

5 – Electrical Improvements

6 – Operating Levels & Pump Control Description

02/02/24 – Design Memo 7 Submitted

7 – Decommissioning Existing Sanitary Pump Station

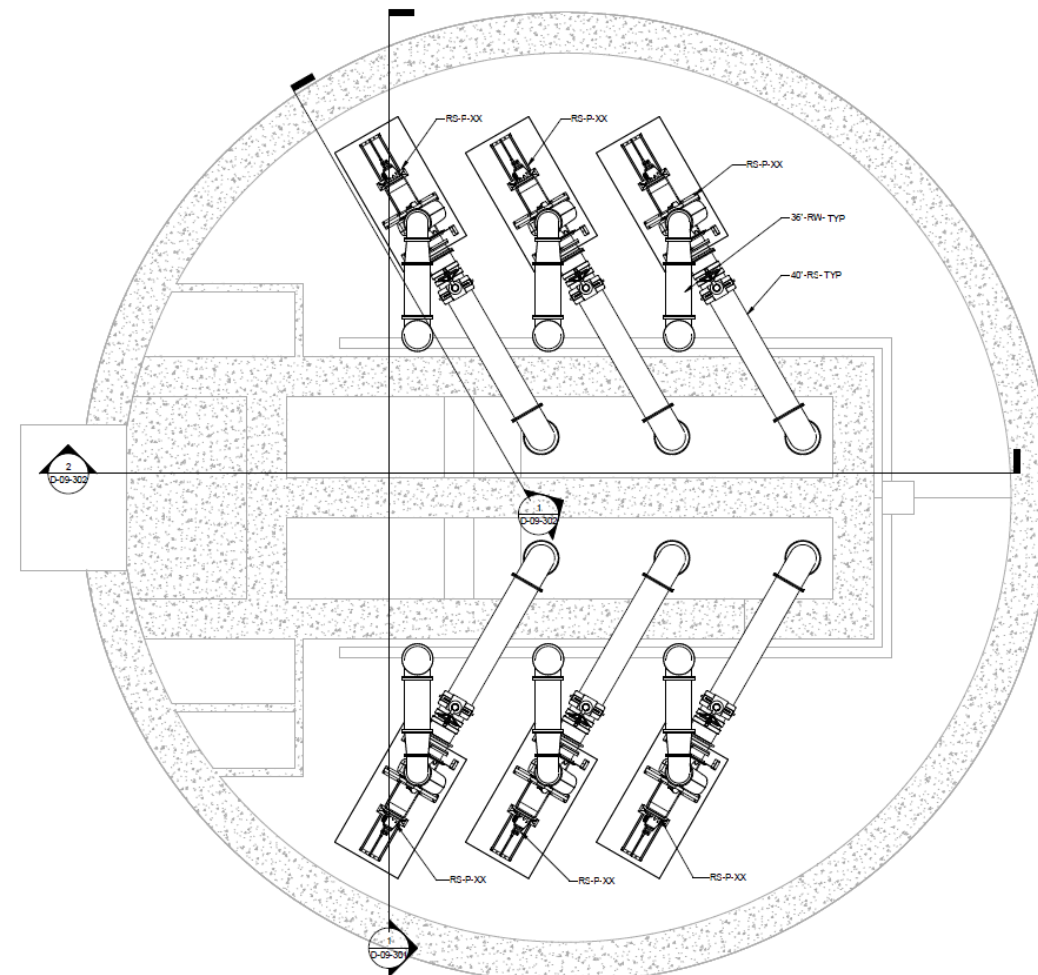
04/17/24 – 30% Design Workshop

← We are here

09/18/24 – 60% Design Workshop

90% Design to be completed in February 2025

Final Design to be completed in May 2025



2204605 - Freud SPS Improvement

Community Engagement and Outreach

- 03/19/24 – District 4 Department of Neighborhoods Meeting
- 04/09/24 – Community Meeting at Immanuel Grace Church
- 05/20/24 – District 4 Monthly Meeting
- 05/31/24 – Launched Freud Sanitary Pump Station Website
 - [Freud Sanitary Pump Station - GLWA \(glwater.org\)](https://glwater.org)
 - Quick Response (QR) Code
- 06/11/24 – Launched Project Specific Email & Phone Number
- 06/26/24 – Community Meeting & Design Review at East Lake Baptist Church

Approval of Utility Right-of-Way Vacation is in progress.

- Agreements have been finalized with DTE Gas & Electric.
- AT&T is working to provide their proposed agreement.
- Item is before the Detroit City Council Public Health & Safety Standing Committee.
- Kokosing continues to detail their plan to greatly reduce road closures from the previous 4-year estimate.



Careers • Financials • Assistance Contact Login •

ABOUT • OUR SYSTEM • MEMBERS • VENDORS INVESTOR RELATIONS

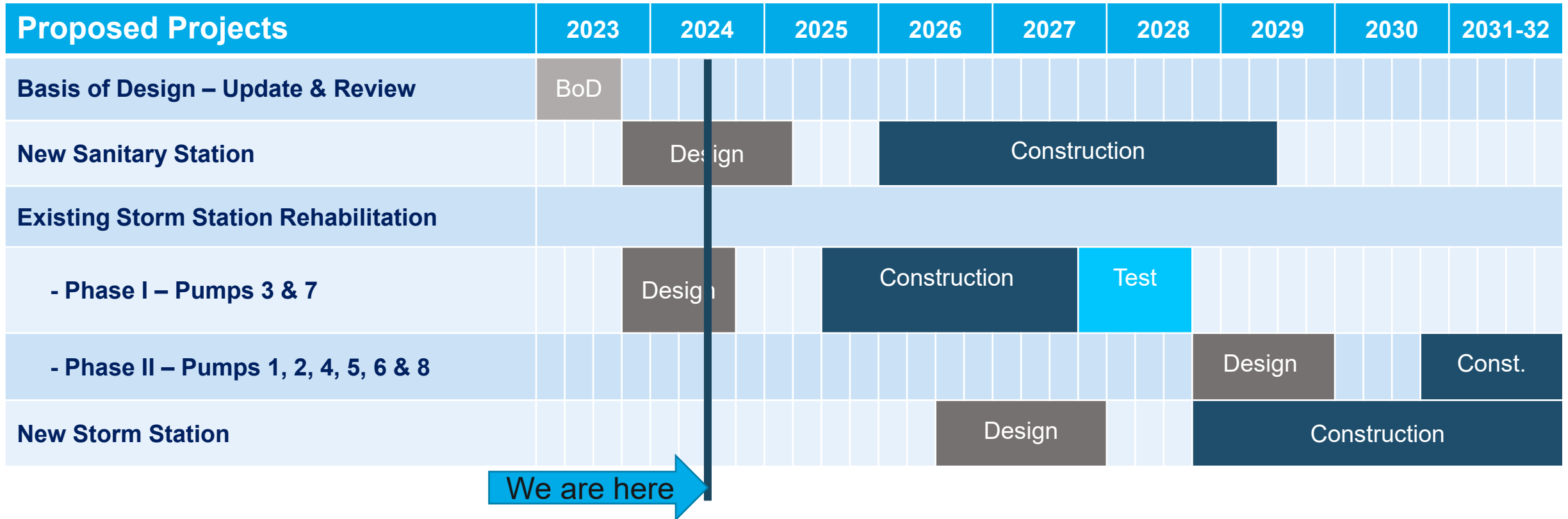


Freud Sanitary Pump Station

The purpose of the Freud Pump Station Improvements Project is to improve operability, reliability, integrity, and maintainability of the station over the life of the facility. The Freud Pump Station is critical for successful conveyance of dry and wet weather flow from the eastern portion of the regional system.



Conner Pump Station Design/Construction Road Map



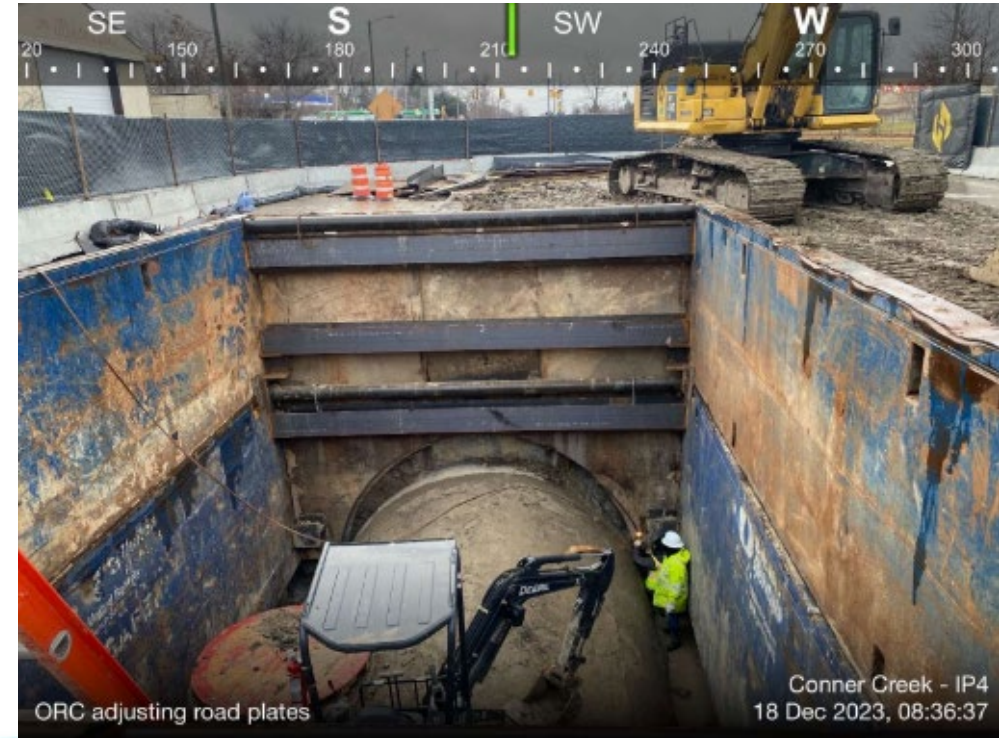
- Revised Basis of Design – Critical Path
 - Workshops: May – July
 - Review: August – September

Existing GLWA Projects

- **CIP - 260701 In System Storage Devices (ISD), Valve Remotes (VR), and Outfall Infrastructure Elements Rehab**
 - **Outfall Infrastructure Project**
 - Improvements are nearly complete at outfalls B-5, B-6, B-14, B-15, B-16, B-21, B-26, B-29, B-33, B-34, B-38, B-40, and B-44
 - Instrumentation and controls are being tested for acceptance at outfalls B-6 and B-21.
 - Coordination with the US Army Corps of Engineers (USACE) at outfall B-7 is underway.
 - **ISDs and VRs Project**
 - ISD equipment installation is complete or nearing completion at ISD 2 through 8, ISD 10, and ISD 11, and ISD 13.
 - Improvements at B-25, B-48, B-83, B-86, and B-95 are complete.
 - Equipment startup and testing by contractor and GLWA staff is ongoing.
 - All ISD sites manhole modifications are complete.
 - Engineer-directed repairs to the inflatable dams will begin in July.

Existing GLWA Projects Continued

- **CIP - 260204 Conner Creek Sewer Cleaning and Rehab**
 - Grouting, rebar coating, and spot repairs continue under the airport and continue next down to I-94. These repairs are the critical path for the project and will continue till the end of the project.
 - Debris removal for the project is complete. 47,000 tons were forecast for the project, 7,200 tons were found across the entire project. The claim for the adjustment in unit price for the differing conditions has been settled with the Contractor. Negotiations for the Federal Emergency Management Agency (FEMA) reimbursement continue.
 - Slip lining between Six and Seven Miles has begun at Seven Mile headed south and will be complete by late fall.
 - The project has added design of forebay modifications upstream of Conner CSO to allow the facility to perform debris removal in the future for better maintenance operations. The work is being added to the current project.



Southeast Michigan Flood Resiliency Study

- GLWA is teaming with USACE to perform a General Investigation Study
- USACE has been funded from the President's approved budget for \$500K for FY 24 and \$600K for FY 25
- GLWA will match USACE funding efforts on a 50/50 basis with in-kind services
- GLWA and USACE are meeting biweekly to develop agreement and scope
- Once the agreement is signed, GLWA can begin accruing costs for its 50/50 match

Sewage Pumpstation Wet Well Level Sensor Verification

Perform Field Verification

- Survey Wet Well Rim Elevation
- Install Permanent Benchmark
- Review Existing Drawings & Schematics
- Measure Wet Well Depth
- Compare Wet Well Level
 - Physical
 - Level Sensor
 - Ovation

Develop Standard Operating Procedures

- Consistent Calibration
- Facility Specific Procedure



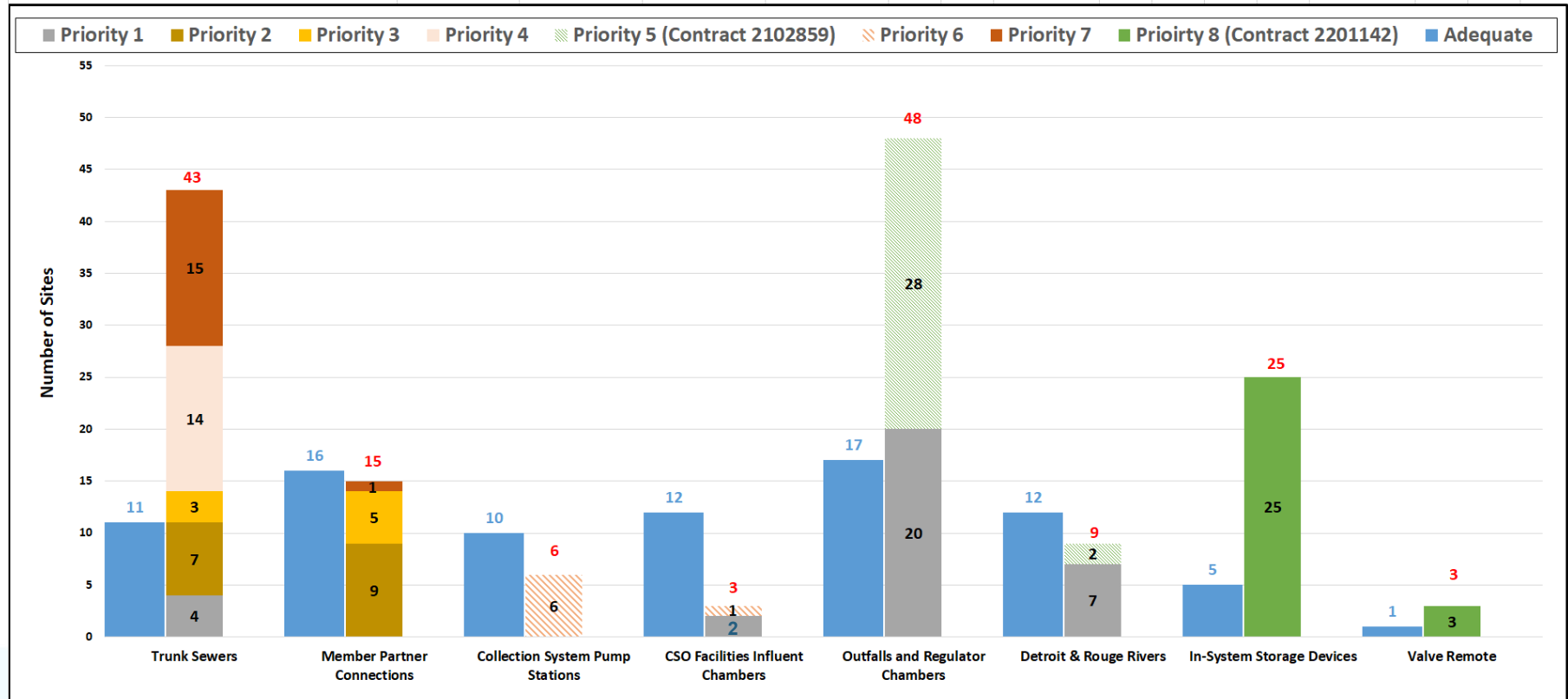
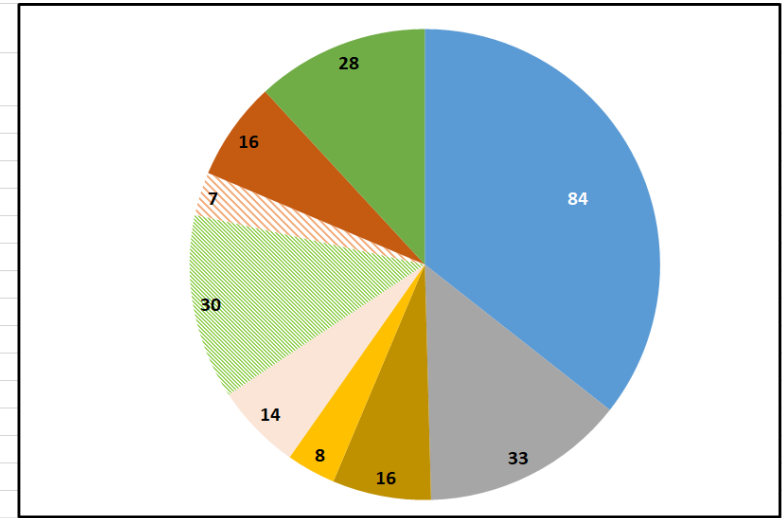
GLWA continues to review the sewer system instrumentation and make corrections in a phased approach.

GLWA released around \$3.55M for revisions to nearly 87 sites. This will complete Priority 1, 2, 3, 4, & 7 sites.

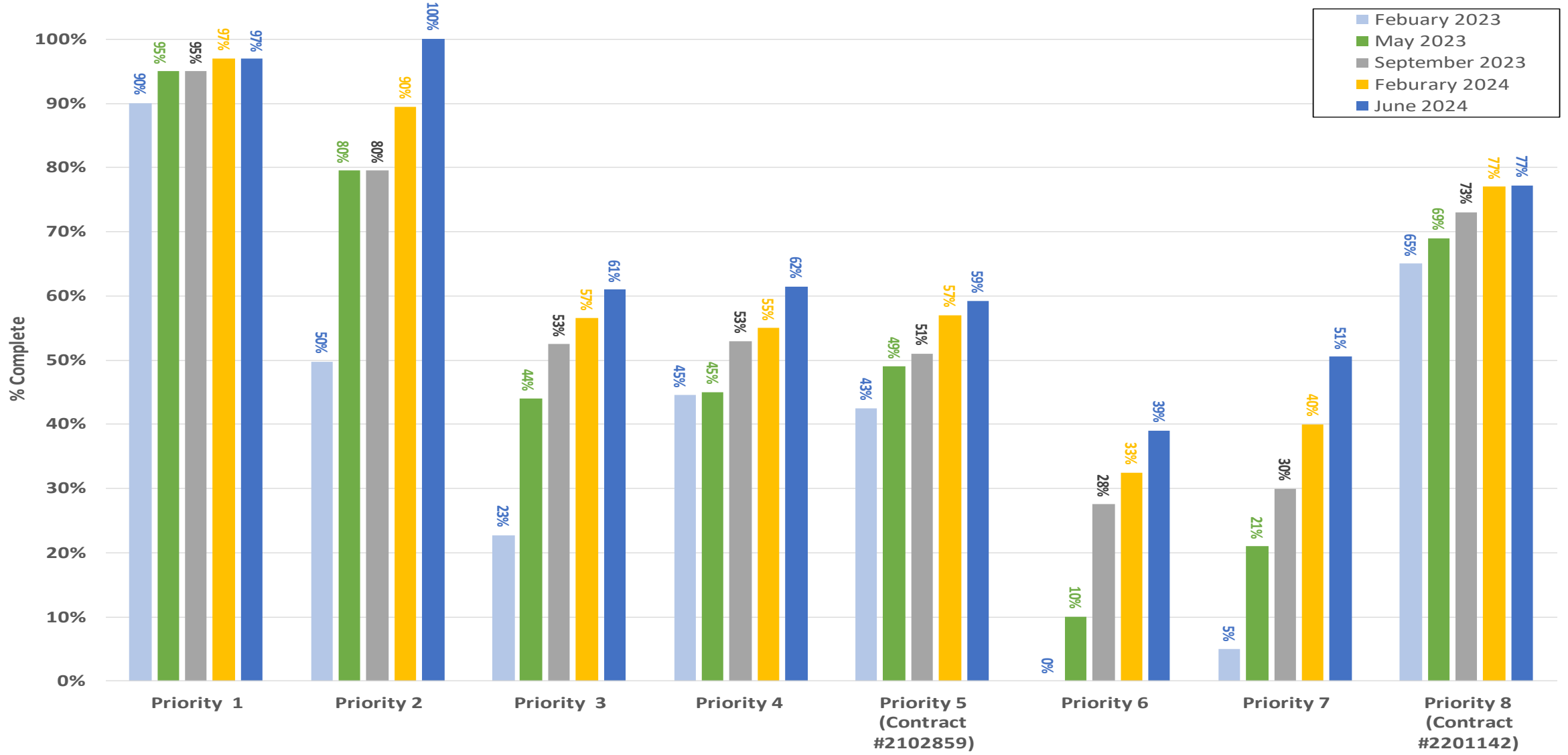


Baseline Conditions
Engineering Services for GLWA Collection System Level Sensors and Precipitation Gauges Program (TOES 30T 2200729)

Level Sensor Group	Priority #	No. of Sites (some sites may include multiple sensors)		
		Adequate Installation	Need Improvement (or New Installation)	Total
Trunk Sewers				
Original L-Series	1, 4, 7	7	24	31
10 L-Sites Surveyed in 2022	1, 2	2	8	10
Sewage Meters (DT-S-00)	1, 4, 7	2	8	10
Hydraulic Viewers	3	0	3	3
Member Partner Connections				
Existing Flow Meters	3, 7	16	6	22
9 Additional Sites (L-Sites & Flow Meters)	2	0	9	9
Collection System Pump Stations				
CSO Facilities Influent Chambers	6	10	6	16
Outfalls and Regulator Chambers (Contract #2102859)	6	12	3	15
River (Detroit & Rouge) Level Sensors	1, 5	17	48	65
In-System Storage Devices (Contract #2201142)	1, 5	12	9	21
Valve Remote (Contract #2201142)	Other Contracts	5	25	30
	Other Contracts	1	3	4
TOTAL		84	152	236



Progress to Date
Engineering Services for GLWA Collection System Level Sensors and Precipitation Gauges Program (TOES 30T 2200729)



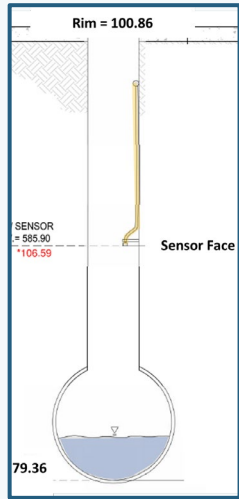
Conveyance System Level Sensor Diagnostic Tool

Applications:

1. Diagnostic tool identifying in **real time** level sensors requiring corrective action
2. Diagnostic tool to evaluate performance of level sensors during **historical events** to support engineering investigations and analyses

How the Level Sensor Diagnostic Tool Works?

Level Sensor



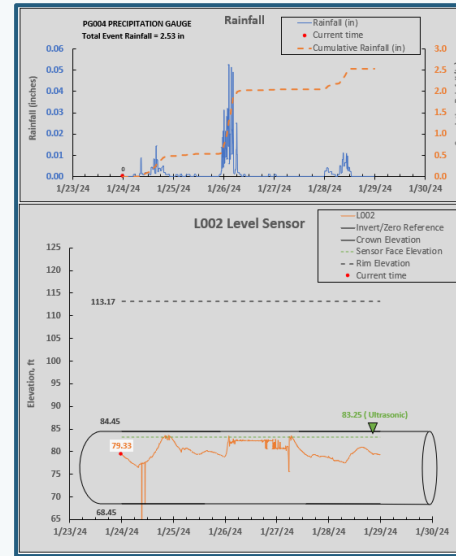
Level Data

GLWA PI Database



Level Data

Diagnostic Tool

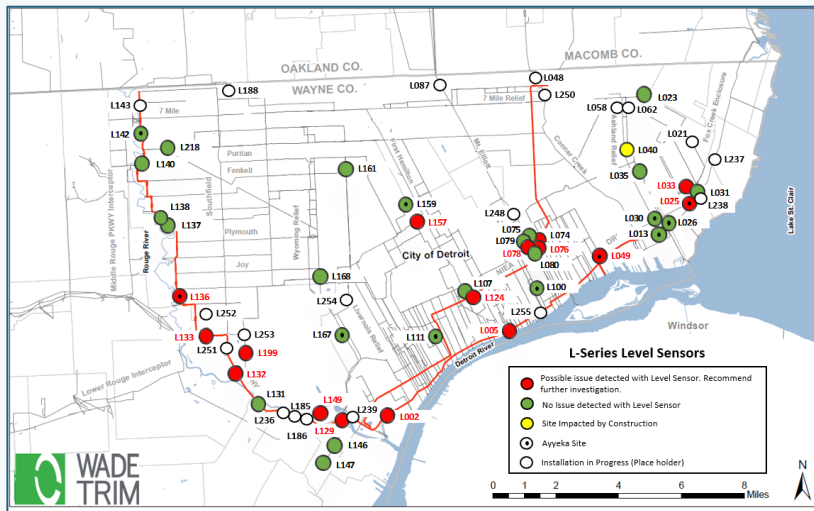


Diagnostic Notes

Dashboard

Level Sensor	Automatically Generated Notes
L002	-Level sensor shows signs of blanking -Level data sporadic for portion of event
L005	-Level sensor shows signs of blanking
L013	
L023	
L025	-Level flatlined for portion of event
L026	
L030	
L031	
L033	-Level data sporadic for portion of event
L035	
L040	-Detected issues may be due to construction activities -Level flatlined for portion of event
L049	-Level flatlined for portion of event
L074	-Level flatlined for portion of event
L075	
L076	-Level flatlined for portion of event
L078	-Level data sporadic for portion of event
L079	
L080	

At-A-Glance Status map

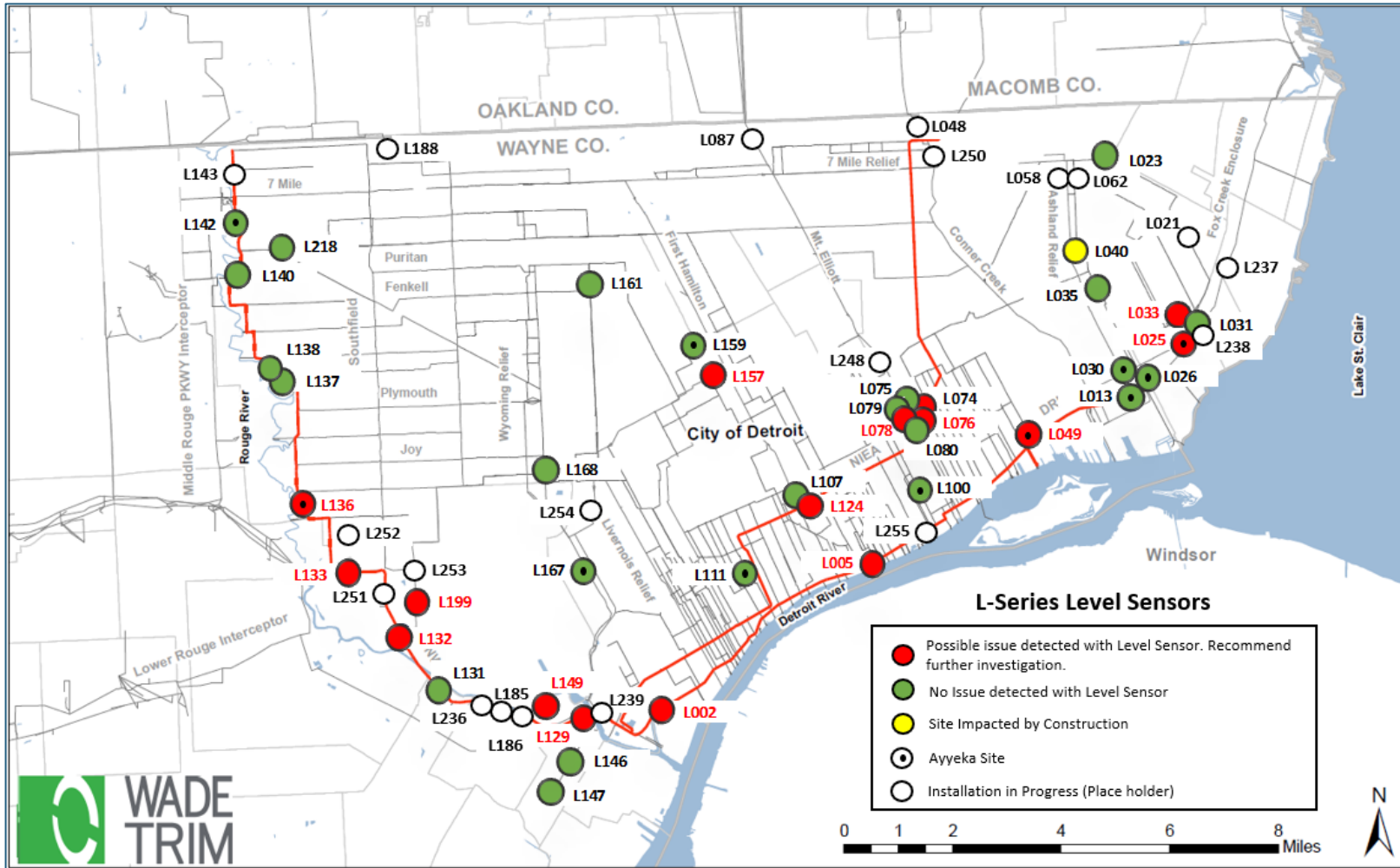


Status

Corrective Action



Follow Up



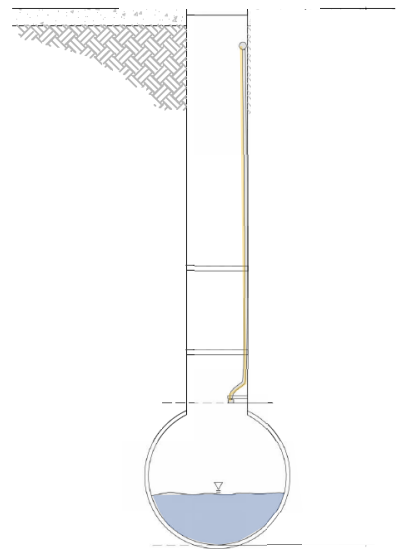
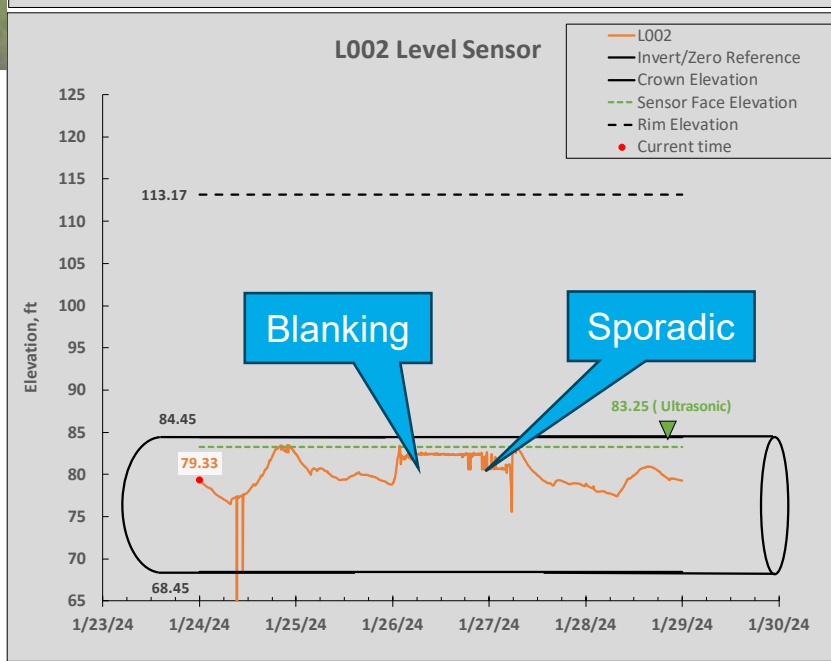
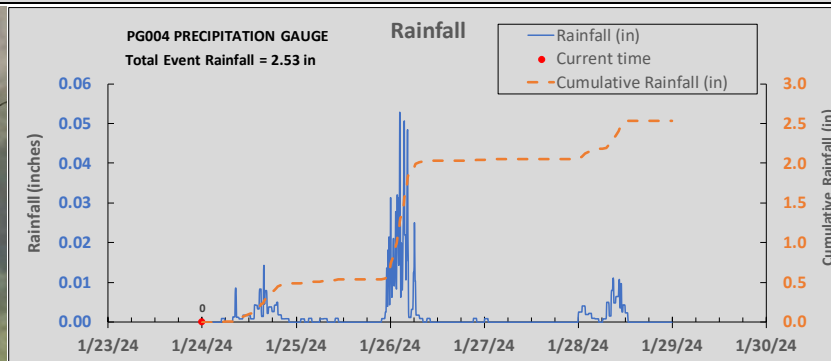
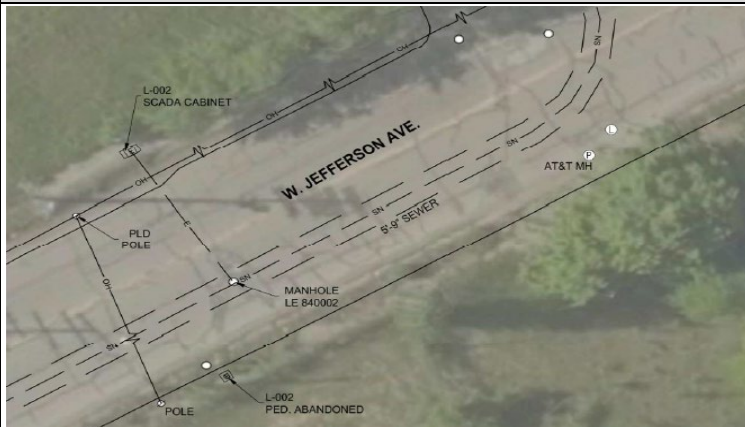
Summary	
# of Level Sensor Sites with No Detected Issues:	24
# of Level Sensor Sites with Possible Issues Detected:	16
# of Level Sensor Sites Impacted by Construction:	1
Total # of Level Sensor Sites:	41

At-a-Glance Status

Individual Sensor Diagnostic Sheets

- Instructions
- Data
- Rainfall
- Control
- Dashboards
- Summary Map
- L002
- L005
- L013
- L023
- L025
- L026
- L030
- L031
- L033
- L035
- L040
- L049
- L074
- L075
- L076
- L078
- L079
- L080
- L100
- L107
- L111

L002 Level Sensor



Automatically Generated Notes

- Level sensor shows signs of blanking
- Level data sporadic for portion of event

Displayed Time:
1/24/24 12:00 AM

Thank you